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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,896	07/23/2001	Oscar Agazzi	1875.1100001	9207

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EXAMINER	
NGUYEN, TOAN D	

ART UNIT	PAPER NUMBER
2665	

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/909,896	AGAZZI ET AL.	
	Examiner	Art Unit	
	Toan Nguyen	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-51* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 July 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 1/2/02; 3/22/02; 11/14/02

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

2. The abstract of the disclosure is objected to because it is more than 150 words. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1- 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Azadet et al (EP 1006697) in view of Winter et al (Electrical Signal Processing Techniques In Long-Haul, Fiber-Optic Systems, AT&T Bell Laboratories).

For claims 1 and 26-30, Azadet et al disclose parallel signal processing for equalization on fibre channels, comprising the steps of:

3) converting the electrical signal to digital electrical signal (figure 1, reference 130-1 to 130-N) (page 3 lines 27-28); and

4) digitally processing the digital electrical signal (figure 1, reference 140, page 3 lines 28-29).

However, Azadet et al do not disclose:

1) receiving an optical data signals;

2) converting the optical signal to an electrical signal.

In an analogous art, Winter et al disclose:

1) receiving an optical data signals (figure 1, page 305.3.1, col. 2 line 12);

2) converting the optical signal to an electrical signal (page 305.3.1, col. 2 lines12-13 and page 305.3.2, col. 1 lines 6-7).

Winter et al disclose wherein step (1) comprises the step of receiving the optical data signal from a single mode optical fiber (figure 1, page 305.3.1, col. 2 line 12) and step (4) comprises the step of equalizing chromatic and/or waveguide dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 26); Azadet et al disclose wherein step (1) comprises the step of receiving the optical data signal from a multimode optical fiber (figure 3, col. 3 lines 32-58) and Winter et al in view of Azadet et al disclose step (4) comprises the step of equalizing chromatic and/or waveguide dispersion from the multimode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 27); wherein step (1) comprises the step of receiving the optical data signal from a single mode optical fiber (figure 1, page 305.3.1 col. 2 line 12) and step (4) comprises the step of equalizing polarization mode dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 2 lines 28-31 as set forth in claim 28); wherein step (1) comprises the step of receiving the optical data signal from a single mode optical fiber (figure 1, page 305.3.1 col. 2 line 12) and step (4) comprises the step of equalizing dispersion induced in the single mode optical fiber by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 29); wherein step (1) comprises the step of receiving the optical data signal from a transmitter that lacks external modulators (figure 1, page 305.3.1, col. 2 lines 3-5 and col. 2 line 12) and step (4) comprises the step of equalizing excess dispersion induced by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 30).

One skilled in the art would have recognized receiving an optical data signals to use the teachings of Winter et al in the system of Azadet et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the receiving an optical data signals as taught by Winter et al in Azadet et al's system with the motivation being to mitigate the effect of intersymbol interference in long-haul, fiber-optic systems (Abstract lines 1-3).

For claim 2, Azadet et al disclose wherein step (4) comprises the step of equalizing the digital electrical signal (figure 4, reference 500, page 3 lines 57-58).

For claim 3, Azadet et al disclose wherein step (4) further comprises the step of performing Viterbi equalization (figure 6, reference 650) on the digital electrical signal (page 4 line 2).

For claim 4, Azadet et al disclose wherein step (4) further comprises the step of performing feed-forward equalization (figure 5, reference 510) on the digital electrical signal (page 4 line 16).

For claim 5, Azadet et al disclose wherein step (4) further comprises the step of performing decision feedback equalization on the digital electrical signal (page 4, line 20).

For claim 6, Azadet et al disclose wherein step (4) further comprises the step of performing Viterbi equalization (figure 6, reference 650) and feed-forward equalization (figure 5, reference 510) on the digital electrical signal (page 2, lines 40-42).

For claim 7, Azadet et al disclose wherein step (4) further comprises the step of performing Viterbi equalization (figure 6, reference 650) and decision feedback equalization on the digital electrical signal (page 2, lines 40-42).

For claim 8, Azadet et al disclose wherein step (4) further comprises the step of performing one or more of the following types of equalization on the digital electric signal:

Viterbi equalization (figure 6, reference 650);

feed-forward equalization (figure 5, reference 510); and

decision feedback equalization (page 2, lines 40-42).

For claims 9 and 32-36, Azadet et al disclose parallel signal processing for equalization on fibre channels, comprising the steps of:

an analog-to-digital converter (figure 1, reference 130) coupled to said optical-to electrical converter (page 3 lines 27-28); and

an digital signal processor (figure 1, reference 140) coupled to said analog-to-digital converter (figure 1, reference 130) (page 3 lines 28-29).

However, Azadet et al do not disclose:

an input;

an optical-to-electrical converter coupled to said input.

In an analogous art, Winter et al disclose: an input (figure 1, page 305.3.1, col. 2 line 12);

an optical-to-electrical converter coupled to said input (page 305.3.1, col. 2 lines12-13 and page 305.3.2, col. 1 lines 6-7).

Winter et al disclose wherein said input is coupled to a single mode optical fiber (figure 1, page 305.3.1, col. 2 line 12) and said equalizer equalizes chromatic and/or waveguide dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 32); Azadet et al disclose wherein said input is coupled to a multimode optical fiber (figure 3, col. 3 lines 32-58) and Winter et al in view of Azadet et al disclose said equalizer equalizes chromatic and/or waveguide dispersion from the multimode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 33); Azadet et al disclose wherein said input is coupled to a multimode optical fiber (figure 3, col. 3 lines 32-58) and Winter et al in view of Azadet et al disclose said equalizer equalizes polarization mode dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 2 lines 28-31 as set forth in claim 34); wherein said input is coupled to a single mode optical fiber (figure 1, page 305.3.1, col. 2 line 12) and said equalizer equalizes dispersion induced in the single mode optical fiber by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 35); wherein said input receives the optical data signal from a transmitter that lacks external modulators (figure 1, page 305.3.1, col. 2 lines 3-5 and col. 2 line 12) and said equalizer equalizes excess dispersion induced by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 36).

One skilled in the art would have recognized an input to use the teachings of Winter et al in the system of Azadet et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the input as taught by Winter et al in Azadet et al's system with the motivation being

to mitigate the effect of intersymbol interference in long-haul, fiber-optic systems (Abstract lines 1-3).

For claim 10, Azadet et al disclose wherein said digital signal processor includes an equalizer (figure 4, reference 500, page 3 lines 57-58).

For claim 11, Azadet et al disclose wherein said equalizer comprises a Viterbi equalizer (figure 6, reference 650) (page 4 lines 1-2).

For claim 12, Azadet et al disclose said equalizer comprises a feed-forward equalizer (figure 5, reference 510) (page 4 line 16).

For claim 13, Azadet et al disclose said equalizer comprises a decision feedback equalizer (page 4, line 20).

For claim 14, Azadet et al disclose wherein said equalizer comprises a Viterbi equalizer (figure 6, reference 650) and a feed-forward equalizer (figure 5, reference 510) (page 2 lines 40-42).

For claim 15, Azadet et al disclose wherein said equalizer comprises a Viterbi equalizer (figure 6, reference 650) and a decision feedback equalizer (page 2, lines 40-42).

For claim 16, Azadet et al disclose wherein said equalizer comprises a feed-forward equalizer (figure 5, reference 510) and a decision feedback equalizer (page 2, lines 40-42).

For claim 17, Azadet et al disclose wherein said equalizer comprises one or more of the following types of equalization on the digital electric signal:

a Viterbi equalizer (figure 6, reference 650);

a feed-forward equalizer (figure 5, reference 510); and

a decision feedback equalizer (page 2, lines 40-42).

For claims 18 and 38-42, Azadet et al disclose parallel signal processing for equalization on fibre channels, comprising the steps of:

means for converting the electrical signal to digital electrical signal (figure 1, reference 130-1 to 130-N) (page 3 lines 27-28); and

means for digitally processing the digital electrical signal (figure 1, reference 140, page 3 lines 28-29).

However, Azadet et al do not disclose:

means for receiving an optical data signals;

means for converting the optical signal to an electrical signal.

In an analogous art, Winter et al disclose:

means receiving an optical data signals (figure 1, page 305.3.1, col. 2 line 12);

means for converting the optical signal to an electrical signal (page 305.3.1, col. 2 lines12-13 and page 305.3.2, col. 1 lines 6-7).

Winter et al disclose wherein said means for receiving an optical signal is coupled to a single mode optical fiber (figure 1, page 305.3.1, col. 2 line 12) and said means for equalizing comprising means for equalizing chromatic and/or waveguide dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 38); Winter et al disclose wherein said means for receiving an optical signal (figure 1, page 305.3.1, col. 2 line 12) and Azadet et al disclose is coupled to a multimode optical fiber (figure 3, col. 3 lines 32-58) and Winter et al disclose said means for equalizing comprises means for

equalizing chromatic and/or waveguide dispersion in the multimode optical fiber (figure 7, page 305.3.6 col. 1 lines 28-29 as set forth in claim 39); Winter et al disclose wherein said means for receiving an optical signal (figure 1, page 305.3.1, col. 2 line 12) and Azadet et al disclose is coupled to a multimode optical fiber (figure 3, col. 3 lines 32-58) and Winter et al disclose said means for equalizing comprises means for equalizing comprises means for equalizing polarization mode dispersion from the single mode optical fiber (figure 7, page 305.3.6 col. 2 lines 28-31 as set forth in claim 40); wherein said means for receiving an optical data signal is coupled to a single mode optical fiber (figure 1, page 305.3.1 col. 2 line 12) and said means for equalizing comprises means for equalizing dispersion induced in the single mode optical fiber by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 41); wherein said means for receiving the optical data signal from a transmitter that lacks external modulators (figure 1, page 305.3.1, col. 2 lines 3-5 and col. 2 line 12), and said means for equalizing comprises means for equalizing excess dispersion induced by laser chirping (page 305.3.2, col. 2 lines 10-14 as set forth in claim 42).

One skilled in the art would have recognized means for receiving an optical data signals to use the teachings of Winter et al in the system of Azadet et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the means for receiving an optical data signals as taught by Winter et al in Azadet et al's system with the motivation being to mitigate the effect of intersymbol interference in long-haul, fiber-optic systems (Abstract lines 1-3).

For claim 19, Azadet et al disclose wherein said means for digitally processing the digital electrical signal include means for equalizing the digital electrical signal (figure 4, reference 500, page 3 lines 57-58).

For claim 20, Azadet et al disclose wherein said means for equalizing the digital electrical signal comprise means for performing Viterbi equalization (figure 6, reference 650) on the digital electrical signal (page 4 line 2).

For claim 21, Azadet et al disclose wherein said means for equalizing the digital electrical signal comprise means for performing feed-forward equalization (figure 5, reference 510) on the digital electrical signal (page 4 line 16).

For claim 22, Azadet et al disclose wherein said means for equalizing the digital electrical signal comprise means for performing decision feedback equalization on the digital electrical signal (page 4, line 20).

For claim 23, Azadet et al disclose wherein said means for equalizing the digital electrical signal comprise means for performing Viterbi equalization (figure 6, reference 650) and a feed-forward equalization on the digital electrical signal (figure 5, reference 510) (page 2 lines 40-42).

For claim 24, Azadet et al disclose wherein said means for equalizing the digital electrical signal comprise means for performing Viterbi equalization (figure 6, reference 650) and a decision feedback equalization on the digital electrical signal (page 2, lines 40-42).

For claim 25, Azadet et al disclose wherein step (1) comprises the step of receiving the optical data signal from a multimode optical fiber (Abstract, page 1

col. 2 lines 1-4) and step (4) comprises the step of equalizing multimode dispersion from the multimode optical fiber (Abstract).

For claim 31, Azadet et al disclose wherein said input is coupled to a multimode optical fiber and said equalizer equalizes multimode dispersion from the multimode optical fiber (Abstract).

For claim 37, Azadet et al disclose wherein said means for receiving an optical signal is coupled to a multimode optical fiber (figure 3, col. 3 lines 32-58) and said means for equalizing comprises means for equalizing multimode dispersion from the multimode optical fiber (Abstract).

6. Claims 43-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Azadet et al (EP 1006697) in view of Winter et al (Electrical Signal Processing Techniques In Long-Haul, Fiber-Optic Systems, AT&T Bell Laboratories) further in view of John A.C. Bingham (Multicarrier Modulation for Data Transmission: An Idea Whose Time Has Come, IEEE Communication Magazine, May 1990).

For claims 43-51, Azadet et al in view of Winter et al do not disclose wherein step (4) comprises the step of decoding a convolutional code. In an analogous art, John A.C. Bingham discloses wherein step (4) comprises the step of decoding a convolutional code (page 12, col. 2 lines 42-45).

John A.C. Bingham discloses wherein step (4) comprises the step of decoding a trellis code (page 12, col. 2 line 14 as set forth in claim 44); wherein step (4) comprises the step of decoding a block code (page 12, col. 2 lines 43-45 as set forth in claim 45); wherein said digital signals processor comprises a

convolutional decoder (page 12, col. 2 lines 42-45 as set forth in claim 46); wherein said digital signals processor comprises a trellis decoder (page 12, col. 2 line 14 as set forth in claim 47); wherein said digital signals processor comprises a block decoder (page 12, col. 2 lines 42-45 as set forth in claim 48); wherein said means for digitally processing the digital electrical signal comprises means for decoding a convolutional code (page 12, col. 2 lines 42-45 as set forth in claim 49); wherein said means for digitally processing the digital electrical signal comprises means for decoding a trellis code (page 12, col. 2 line 14 as set forth in claim 50); wherein said means for digitally processing the digital electrical signal comprises means for decoding a block decoder (page 12, col. 2 lines 42-45 as set forth in claim 51).

One skilled in the art would have recognized decoding a convolutional code to use the teachings of John A.C. Bingham in the system of Azadet et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention, to use the decoding a convolutional code as taught by John A.C. Bingham in Azadet et al's system with the motivation being desired that all of the data on one symbol (block) be decoded in the same period and from only the signals received within that block (page 12, col. 2 lines 43-45).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan D Nguyen whose telephone number is 571-272-3153. The examiner can normally be reached on M-F (7:00AM - 4:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Huy Vu can be reached on 571-272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER